

Specification of Thermoelectric Module

TES1-05350

Description

The 53 couples, 12 mm × 36 mm size module which is made of selected high performance ingot to achieve superior cooling performance and greater delta T up to 70 °C, designed for superior cooling and heating up to 100/200 °C applications. If higher operation or processing temperature is required, please specify, we can design and manufacture the custom made module according to your special requirements.

Features

- No moving parts, no noise, and solid-state
- Compact structure, small in size, light in weight
- Environmental friendly
- RoHS compliant
- Precise temperature control
- Exceptionally reliable in quality, high performance

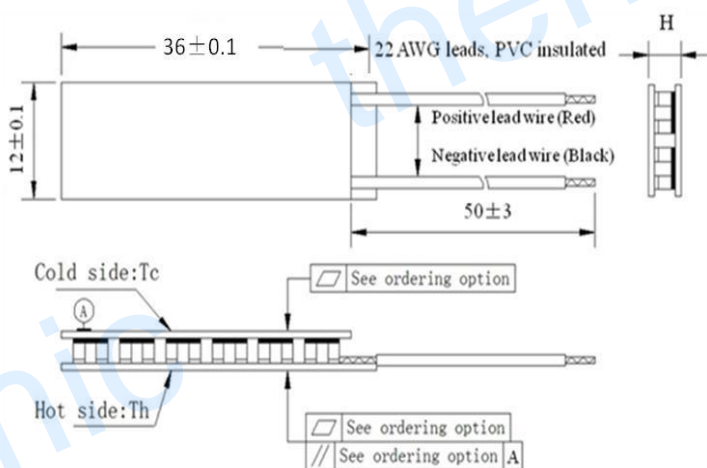
Application

- CCD Sensor
- Laser cooling
- Temperature stabilizer
- CPU cooler and scientific instrument
- Photonic and medical systems

Performance Specification Sheet

| | | | |
|----------------------------|------|------|---|
| Th(°C) | 27 | 50 | Hot side temperature at environment: dry air, N ₂ |
| DT _{max} (°C) | 70 | 79 | Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side |
| U _{max} (Voltage) | 6.8 | 7.4 | Voltage applied to the module at DT _{max} |
| I _{max} (amps) | 5 | 5 | DC current through the modules at DT _{max} |
| Q _{Cmax} (Watts) | 21.4 | 23.3 | Cooling capacity at cold side of the module under DT=0 °C |
| AC resistance(ohms) | 1.01 | 1.09 | The module resistance is tested under AC |
| Tolerance (%) | ± 10 | | For thermal and electricity parameters |

Geometric Characteristics Dimensions in millimeters



Manufacturing Options

A. Solder:

1. T100: BiSn (Tmelt=138°C)
2. T200: CuSn (Tmelt = 227 °C)

B. Sealant:

1. NS: No sealing (Standard)
2. SS: Silicone sealant
3. EPS: Epoxy sealant
4. Customer specify sealing

C. Ceramics:

1. Alumina (Al₂O₃, white 96%)
2. Aluminum Nitride (AlN)

D. Ceramics Surface Options:

1. Blank ceramics (not metallized)
2. Metallized (Au plating)

Ordering Option

| Suffix | Thickness H (mm) | Flatness/ Parallelism (mm) | Lead wire length(mm) Standard/Optional length |
|--------|------------------|----------------------------|---|
| TF | 0:3.2 ± 0.1 | 0: 0.1/0.13 | 50±3/Specify |
| TF | 1:3.2 ± 0.05 | 1: 0.08/0.1 | 50±3/Specify |
| TF | 2:3.2 ± 0.025 | 2: 0.05/0.08 | 50±3/Specify |

Eg. TF01: Thickness 3.2 ± 0.1 (mm) and Flatness 0.08/0.1 (mm)

Naming for the Module

TES1-05350- X -X - X - X



TES1-05350-T200-NS-TF01-AIO

T200: CuSn (Tmelt=227°C)

NS: No sealing

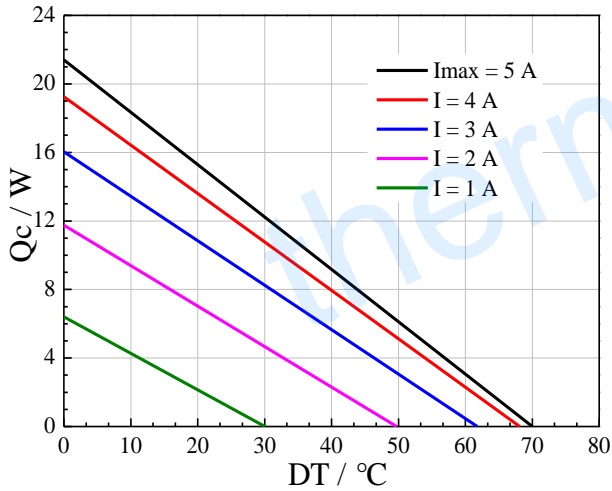
AIO: Alumina, white 96%

TF01: Thickness ± 0.1 (mm) and Flatness/Parallelism 0.08/0.1 (mm)

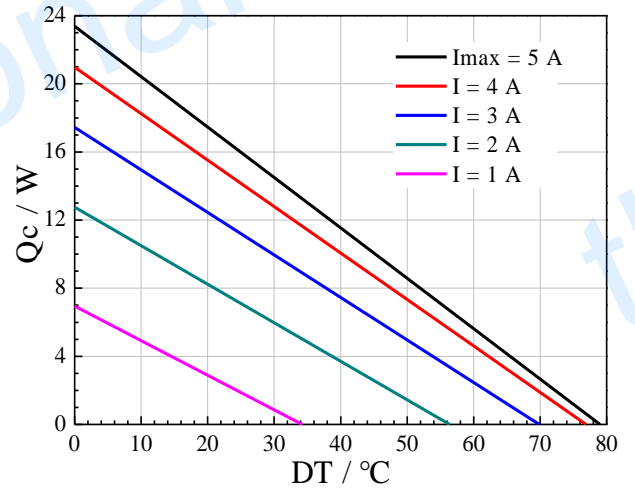
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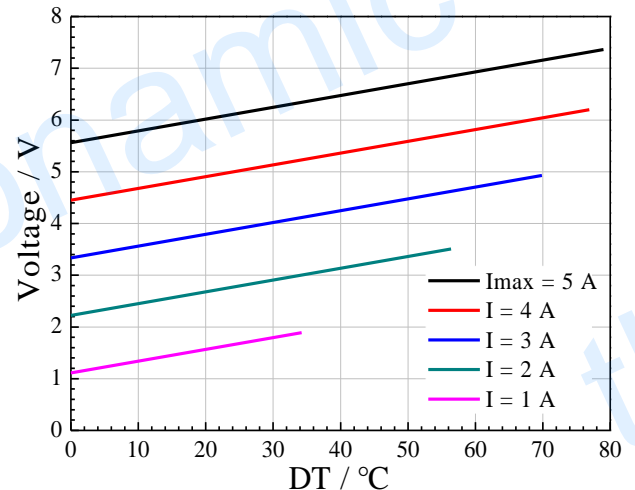
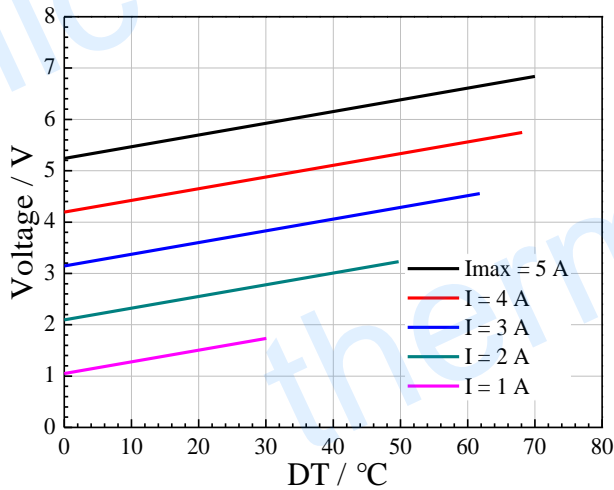
Performance Curves at $T_h=27\text{ }^\circ\text{C}$



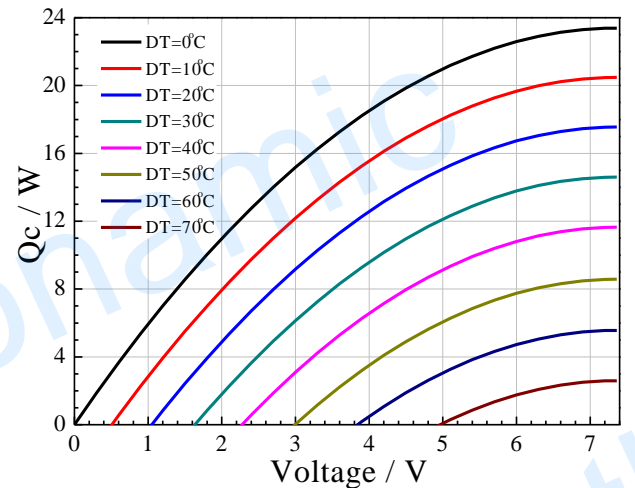
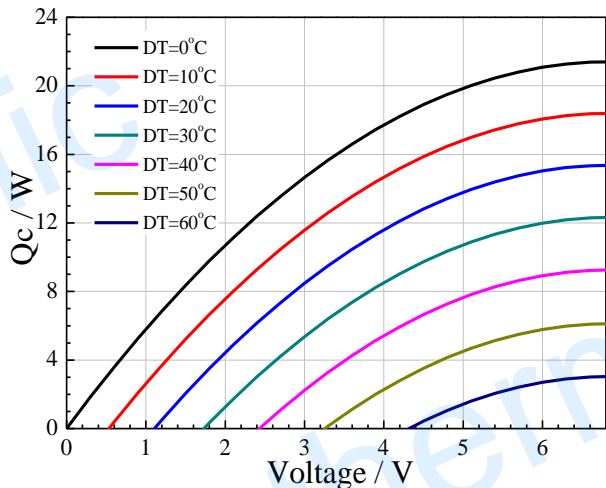
Performance Curves at $T_h=50\text{ }^\circ\text{C}$



Standard Performance Graph $Q_c = f(DT)$



Standard Performance Graph $V = f(DT)$

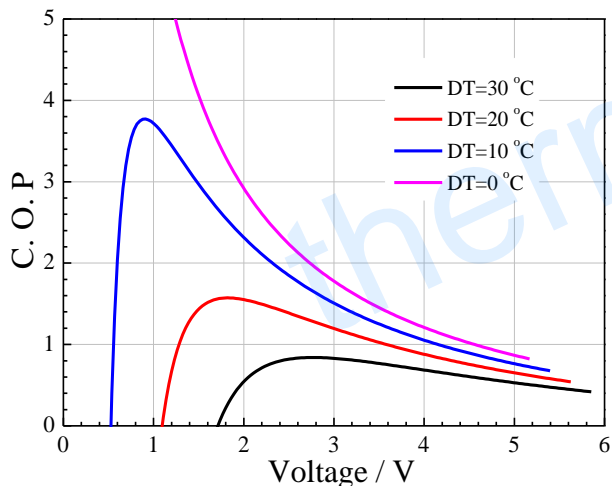


Standard Performance Graph $Q_c = f(V)$

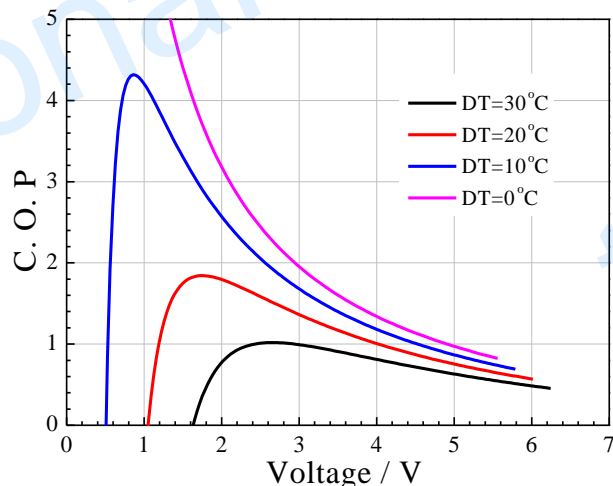
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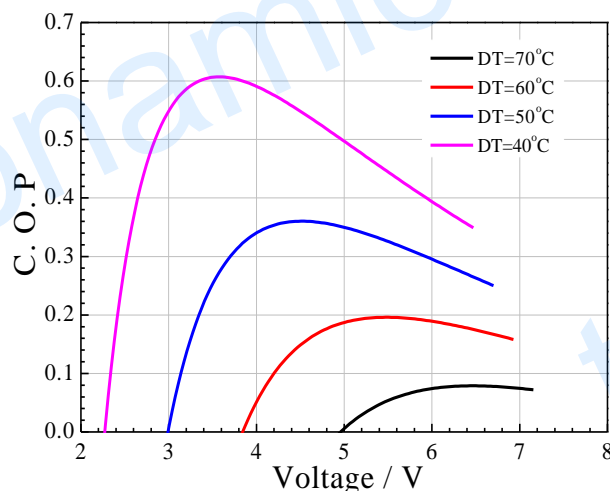
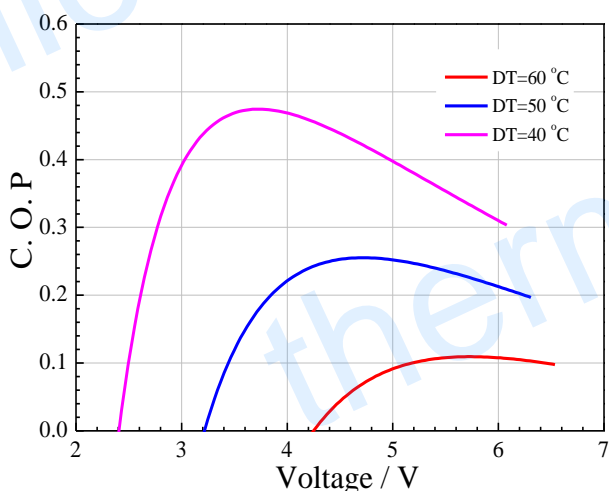
Performance Curves at $T_h=27\text{ }^\circ\text{C}$



Performance Curves at $T_h=50\text{ }^\circ\text{C}$



Standard Performance Graph COP = f(V) of DT ranged from 0 to 30 °C



Standard Performance Graph COP = f(V) of DT ranged from 40 to 60/70 °C

Remark: The coefficient of performance (COP) is the cooling power Q_c /Input power ($V \times I$).

Operation Cautions

- Cold side of the module stucked on the object being cooled
- Hot side of the module mounted on a heat radiator
- Storage module below 100 °C
- Operation below I_{max} or V_{max}
- Work under DC

Note: All specifications subject to change without notice.